The Role of the General Practitioner-Family Doctor in the Pharmacotherapy of Tuberculosis During the War

Daryna Vovk (general practitioner – family doctor, Municipal enterprise "Center of primary medical and sanitary care of the city of Oleksandria" of the Oleksandria City Council, Ukraine)
Oleksandr Puhach (general practitioner – family doctor, Municipal enterprise "Center of primary medical and sanitary care of the city of Oleksandria" of the Oleksandria City Council, Ukraine)
Liliia Bachynska (head of the outpatient clinic, city pediatrician, Municipal enterprise "Center of primary medical and sanitary care of the city of Oleksandria" of the Oleksandria City Council, Ukraine)
Rita Poryvai (head of the outpatient clinic, general practitioner – family doctor, Municipal enterprise "Center of primary medical and sanitary care of the city of Oleksandria" of the Oleksandria City Council, Ukraine)
Mykhailo Shkyria (head of the outpatient clinic, general practitioner – family doctor, Municipal enterprise "Center of primary medical and sanitary care of the city of Oleksandria" of the Oleksandria City Council, Ukraine)
*Corresponding author: Rita Poryvai

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Abstract. The role of the general practitioner-family physician in the pharmacotherapy of tuberculosis during the war is extremely important. The military conflict can cause an increase in cases of tuberculosis due to the deterioration of hygienic conditions, internal displacement of the population, evacuation of patients, insufficient medical and pharmaceutical assistance. In a wartime setting, family physicians may be the primary providers of early diagnosis and pharmacotherapy for many tuberculosis patients. Crowding of people in damp shelters, insufficient nutrition, stress. The role of family physicians is to properly treat and monitor patients, prevent the spread of tuberculosis, and collaborate with other specialists for optimal management of this disease.

Keywords: general practitioners, family doctors, tuberculosis, diagnosis, pharmacotherapy, control, war.

Introduction. The World Health Organization (WHO) has said that the number of deaths from tuberculosis in Europe is rising again after falling for almost 20 years. According to the latest figures available, tuberculosis claimed the lives of 27,300 Europeans in 2021, compared to 27,000 the year before. In total, in the world in 2021, 10.6 million people fell ill with tuberculosis. The WHO cites the COVID-19 pandemic, COVID-19, post-COVID-19, long-COVID and comorbid disorders, associated restrictions, reorientation of medical resources, delayed diagnosis, and the spread of drug-resistant tuberculosis [1-7].

In 2021, approximately 230,000 people contracted tuberculosis in 53 countries of the WHO European Region, including Central Asian countries. Specialists of the WHO European region told AFP that this figure continues to decrease compared to previous years. The increase of deaths from tuberculosis in 2021 is most likely the result of delayed or non-diagnosis of tuberculosis due to disruptions in tuberculosis services during the COVID-19 pandemic, resulting in increased disease severity and associated deaths. The most affected country is called Ukraine, where about 3,600 people died from tuberculosis. In addition, the prevalence of drug-resistant tuberculosis also increased in 2021: one in three cases of the disease was resistant to rifampicin, the main drug used to treat the disease [8].

The purpose of the study was to conduct a review of scientific sources regarding the role of the general practitioner-family doctor in the pharmacotherapy of tuberculosis during the war in Ukraine.

Materials and methods. In the study, there were educational and methodological materials of the Department of Pharmacy of Luhansk State Medical University developed; methodical developments for lectures, seminars, and practical classes at the cycle of thematic improvement "Tuberculosis: medical and pharmaceutical assistance, legal support" for medical, pediatric and dentistry doctors. In order to achieve the set goal, the methods of regulatory and legal, documentary methods of analysis, as well as the questionnaire method were used.

The research of the article is a fragment of research works of Kharkiv Medical Academy of Postgraduate Education on "Improving the organizational and legal procedure for providing patients with drugs from the standpoint of forensic pharmacy, organization and management of pharmacy" (state registration number 0116U003137, terms 2016-2020) and "Pharmaceutical and medical law: integrated approaches to the system of drug circulation from the standpoint of forensic pharmacy and organization of pharmaceutical business" (state registration number 0121U000031, terms 2021-2026); Petro Mohyla Black Sea National University on the topic "Conceptual interdisciplinary approaches to the drug circulation system, taking into account organizational and legal, technological, biopharmaceutical, analytical, pharmacognostic, forensic and pharmaceutical, clinical and pharmacological, pharmacoeconomic, pharmacotherapeutic aspects" (state registration number 0123U100468, implementation period 2023-2028); Luhansk State Medical University "Conceptual interdisciplinary approaches to pharmaceutical provision and availability of drugs, taking into account organizational and legal, technological, analytical, pharmacognostic, forensic and pharmaceutical, clinical and pharmacological, pharmacoeconomic, marketing, social and economic competencies" (state registration number 0123U101632, terms 2023-2027).

Results and discussion. Tuberculosis (from the Latin Tuberculum – fungus+osis) is an infectious disease caused by Mycobacterium tuberculosis. Treatment of tuberculosis is a complex and lengthy process that usually requires specialized medical care. Family doctors can be included in the process of tuberculosis treatment. More often, they cooperate with phthisiologists, infectious disease specialists, pulmonologists who have special knowledge and experience in this field.

The main drug pharmacotherapy for tuberculosis includes a combination of antibacterial drugs: isoniazid, rifampicin, ethambutol, and pyrazinamide. These drugs have a powerful effect against the bacterium Mycobacterium tuberculosis, which causes tuberculosis. To effectively control the treatment of tuberculosis, it is necessary to ensure the correct prescription and supervision of these drugs, to evaluate the results of laboratory tests and to monitor the patient's condition.

Family doctors play an important role in detecting symptoms of tuberculosis, referring patients for specialized examination and initial treatment. Family physicians provide supervision and control of patients during pharmacotherapy. Contribute to compliance with the schedule and regimen of treatment of patients with tuberculosis. Observe possible side effects of antibacterial drugs.

In Ukraine, the treatment of tuberculosis patients is the duty of doctors and nurses of general practice of family medicine. The program of medical guarantees of the National Health Service of Ukraine provides for the financing of the package "Support and treatment of adults and children with tuberculosis at the primary level of medical care" [9].

One of the keys focuses of the 2021 Medical Guarantee Program is bringing medical care closer to the patient. An example of how this happens is the new package "Support and treatment of adults and children with tuberculosis at the primary level of medical care". It improves the availability and quality of medical services for patients with tuberculosis.

Providers of primary medical care voluntarily conclude a contract for such a package of medical services and receive additional payment for it. The tariff for the support and treatment of adults and children with tuberculosis at the primary level of medical care is 775 UAH for 1 patient per month. Adjustment coefficients are set for the tariff, which stimulate effective treatment. Coefficient 2 — for the month in which the patient achieved the result “cured” and “treatment

completed" according to the electronic health care system and 0.75 — for each month in which the patient continues treatment.

This provision of anti-tuberculosis care brings the service closer to patients and ensures continuity of treatment. That is, as soon as the patient stops excreting mycobacterium tuberculosis, which has laboratory confirmation, he can be treated on an outpatient basis and live a socially fulfilling life. The patient is not in a hospital, but in comfortable conditions at home. The family doctor monitors the patient's use of medication and the effectiveness of treatment.

To receive such assistance free of charge, the patient must have an electronic referral with the appropriate diagnosis, issued by a phthisiatrician. The patient applies to the nearest primary care facility, which has a contract with the National Health Service of Ukraine under the package "Support and treatment of adults and children with tuberculosis at the primary level of medical care."

The new package includes controlled treatment, monitoring, supervision, psychosocial support of patients [10]:

- ✓ dynamic monitoring of the patient's condition;
- ✓ organizing the collection of biological material for further research at the regional phthisiatric or pulmonology center;
- ✓ determination of the treatment model together with the patient based on the recommendation of a phthisiatrician and doctors of other specialties in the case of comorbid pathologies;
- ✓ organization and pharmaceutical supply of patients with anti-tuberculosis drugs;
- ✓ family doctors receive anti-tuberculosis drugs from phthisiatric doctors and pulmonary centers.

In Ukraine, due to the war and priorities of survival, up to 20% of the population do not turn to family doctors with possible symptoms of tuberculosis. Today, about 20% of the population of Ukraine experience a shortage of medical and pharmaceutical care due to the fact that they do not go to the family doctor for preventive examinations or are temporarily displaced persons who have other priorities, or the issue of self-defense is triggered.

Vaccination against tuberculosis is carried out with the BCG vaccine (lat. BCG), short for Bacillus Calmette-Guérin (lat. Bacillus Calmette–Guérin). BCG is the only existing vaccine against tuberculosis, made from Mycobacterium bovis and first used in 1921. It is included in the list of essential medicinal products of WHO [12].

An important factor is that vaccination against BCG for the prevention of tuberculosis must meet the indicators recommended by WHO. According to them, at least 95% of the population must be vaccinated in each country. For comparison: in 2022, this indicator was at the level of 77% in Ukraine.

Since 2023, Ukraine has used an updated legislative, regulatory, and instructional-methodical framework for the fight against tuberculosis:

- Order of the Ministry of Healthcare of Ukraine No. 102 dated January 01, 2023 "On approval of standards of medical care "Tuberculosis" [13]
- Tuberculosis. Evidence-based clinical guidelines [14, 15]
- Standards of medical care "Tuberculosis" [16].

In Ukraine, sputum microscopy was abandoned as an insufficiently effective method and switched to the diagnosis of tuberculosis thanks to molecular genetic systems. Any patient can find an institution with such a system near him and undergo a free diagnosis. Detection of tuberculosis in children has improved. Biomaterial is currently being studied on GeneXpert systems - a non-invasive, fast, and painless method.

The new standards also provide for outpatient, decentralized, patient-oriented treatment. This means that, in particular, children will be able to attend schools and kindergartens [17, 18].

Those who were forced to leave their homes due to the war, as well as persons living in the zone of active hostilities, have a special risk of becoming infected. Lack of funds and warm clothes, as well as housing for displaced people, contribute to the spread of tuberculosis. Also, during an air raid, people hide in bomb shelters, many of which are overcrowded, as are the evacuation trains. These situational moments, which also increase the risk of infection. Experts warn against the rapid

spread of HIV/AIDS, tuberculosis, and outbreaks of other infectious diseases, in particular, cholera [19].

Several factors play a role in overcoming tuberculosis on a national scale. In addition to the medical system, the culture of society to care about one's health and the absence of prejudice towards the diagnosis of tuberculosis is important.

We cite examples from forensic pharmaceutical practice regarding tuberculosis and violation of patients' rights just because they had tuberculosis [20].

Example 1. Before her illness, a woman worked on the electricity grid in the village. She wanted to return to work after finishing treatment for tuberculosis. But the management refused her, explaining that after such an illness it is dangerous to communicate with her and the attitude towards her from the people who work there will be similar. The problem was solved through the head of the village and an educational conversation about the violation of rights. The woman returned to work.

Example 2. Before the illness, the woman worked growing vegetables in the fields. After the phthisiatric hospital, she returned and continued outpatient treatment. The person needed to be excused from work from time to time in order to receive medication and examination. When the management found out about her diagnosis, the team also found out about it – woman was fired. The patient asked for help and they found a way out for her – new employer hired her. He himself suffered from tuberculosis in the past and therefore understands very well the people affected by this problem [20].

The role of the general practitioner-family doctor in the pharmacotherapy of tuberculosis during the war can be very important and responsible. In times of war, access to specialized medical care may be limited or interrupted. Therefore, family doctors can play a crucial role in the identification, treatment, and supervision of patients with tuberculosis.

The main responsibilities of a general practitioner in the pharmacotherapy of tuberculosis include:

1. *Diagnostics.* A family doctor should detect suspicion of tuberculosis in patients: acute cough, accumulation of mucus, hemoptysis, swelling of lymph nodes, etc. The family doctor takes an anamnesis, conducts a physical examination, performs the necessary laboratory tests (x-rays, sputum for tuberculosis bacteria).

2. *Pharmacotherapy.* If tuberculosis is suspected, the family doctor should start treatment with antibacterial drugs. Uses a standard regimen of pharmacotherapy in accordance with the requirements of standards and clinical protocols. The family doctor monitors the patient's response to the medication. Monitors side effects. Has the right to carry out pharmaceutical correction of prescriptions if necessary.

3. *Support and consulting.* The family physician provides support and counseling for patients receiving pharmacotherapy at home. The family doctor provides information on the correct use of medicines, compliance with the dosage regimen, and nutrition. Answers questions and solves problems that arise in patients during treatment and pharmacotherapy.

4. *Cooperation with other specialists.* A family doctor may collaborate with other specialists, such as pulmonologists, infectious disease specialists, and phthisiologists, for consultation and additional treatment of tuberculosis patients.

5. *Monitoring.* The general practitioner-family doctor should conduct regular monitoring of the patient's condition, evaluate the effectiveness of the treatment, and identify any side effects or complications associated with referring the patient for additional treatment of tuberculosis.

6. *Rehabilitation and post-treatment support.* A general practitioner doctor can assist in the organization of post-treatment support and rehabilitation of patients with tuberculosis after completion of pharmacotherapy. This may include providing advice on a healthy lifestyle, diet, and regular check-ups to prevent tuberculosis from recurring.

7. *Prevention of the spread of the disease.* The family doctor pays attention to the prevention and control of the spread of tuberculosis among other patients and the general population. This may include the implementation of sanitary and hygienic measures, education about the transmission of the disease and the use of isolation measures for the sick.

In the pharmacotherapy of drug-resistant tuberculosis in Ukraine, treatment regimens were implemented in the conditions of the BPaL operational study with the third new anti-tuberculosis drug – pretomanid, developed over the past 50 years. In August 2021, the FDA (Food and Drug Administration (USA) approved the use of the new anti-tuberculosis drug pretomanid for the pharmacotherapy of extensively drug-resistant tuberculosis, as well as cases of treatment failure of multidrug-resistant tuberculosis. Subsequently, the Ministry of Health announced the registration in to Ukraine, an innovative drug in the pharmacotherapy of severe forms of tuberculosis, pretomanid. Ukraine became the fifth country in the world to grant permission for the use of pretomanid. With this treatment regimen, patients with the most severe forms of the disease can be treated for six months instead of a year and a half or even more. For patients with sensitive tuberculosis also became possible to be treated for four months instead of the traditional six [21-23]. In a military conflict, when access to drugs and medical care can be difficult, a general practitioner-family doctor can become the only medical specialist who provides treatment, pharmacotherapy, quality control, and monitoring of tuberculosis patients [24]. It is important to note that in times of war, access to medical and pharmaceutical care and resources may be limited. General practitioners must have prioritization skills and work in a resource-constrained environment to provide emergency medical and pharmaceutical care to tuberculosis patients who require immediate treatment.

Therefore, general practitioners-family doctors play a critical role in the pharmacotherapy of tuberculosis during wartime, ensuring proper medical care and treatment of patients in difficult conditions.

Conclusion. The role of the general practitioner-family physician in the pharmacotherapy of tuberculosis during the war is extremely important. A military conflict can cause an increase in tuberculosis cases due to the deterioration of hygienic conditions, the inadmissibility of evacuation of patients and insufficient medical care. In wartime settings, where access to medical and pharmaceutical care may be limited, general practitioners may be the primary health care providers for many tuberculosis patients. The role of family physicians is in early diagnosis, appropriate treatment, and monitoring of patients, ensuring prevention of the spread of tuberculosis and cooperation with other specialists for optimal management of this disease.

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